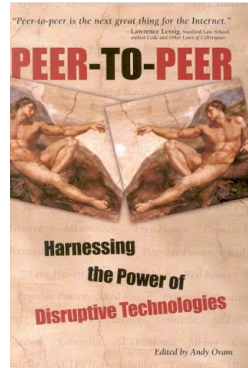


Peer to Peer

- What is peer to peer?
 - Useful? Disruptive?
 - Manageable, governable?
 - Architecture
- Napster, Gnutella, Limewire, Kazaa, BitTorrent, Rapidshare, Usenet, Skype
 - Which are p2p?



Kazaa and Skype, Disruptive?

“Skype literally touches millions of lives and this is something to be proud of...I would like to think that we have contributed to making the world a little bit flatter.”



www.crunchbase.com

When Niklas is not creating innovative, disruptive businesses, he is a passionate sailor and enjoys offshore racing with his wife as well as skiing. (Niklas Zennstrom)

Kazaa and Skype, Disruptive?

Skype has been an incredible adventure and I am proud to have been part of it. Looking back at 2003, at two guys running around with a crazy idea of building a global phone company purely on the Internet, ..., still battling a major lawsuit from our Kazaa days, 2003 seems a long time ago. It is amazing to think that it is only four years!

Janus Friss blog

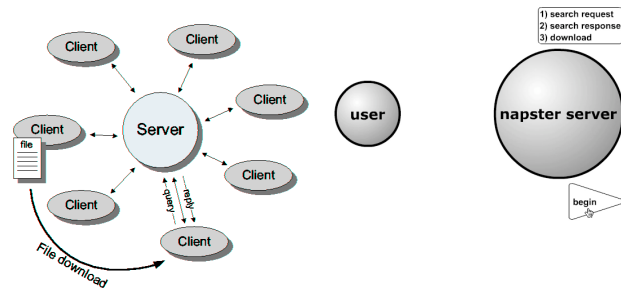


Sky (peer to peer) Skyper → Skype

- eBay purchases for \$2.6 billion in 2005
 - Subsequently marked down, resold
- Bootstrapping after login, but true p2p
 - Find a peer...
- Proprietary code, some open standards
 - AES, RSA, for encryption

Napster is Centralized p2p

● Legal ramifications?



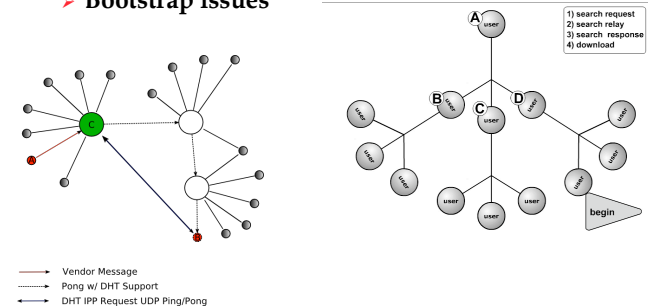
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12.5

Gnutella/Limewire decentralized p2p

● Distributed

➤ Bootstrap issues



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12.6

P2P: origins and current state

● Shawn Fanning

- Napster, 1998-99
- Under 20, mp3, ...
- Centralized server
- Rupture, EA \$15 million



● Justin Frankel

- Winamp, 1998-99
- Just 20, mp3, ...
- AOL, \$50+ million
- Gnutella



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12.7

Napster, copyright, law

● Napster was centralized, file-sharing/p2p

- Location of files, location of index.

● Started just after DMCA, court cases new

- A&M Records, Inc. v. Napster, Inc.
- Direct, contributory, vicarious infringement

● Compare Grokster? <http://www.grokster.com>

- Microsoft, RIAA, Mark Cuban, ...

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- Started by Bram Cohen,
<http://bitconjurer.org>
 - Distributed p2p, torrent, tracker
 - You must cooperate to download
 - 20-30% of all Internet traffic
- Files are split up and downloaded in pieces
 - Advantages? Disadvantages?
- Seeder, swarm, clients
 - "optimistic unchoking" not tit-for-tat?



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12.9

Brian Fox

- GNU Bash Shell (developer)
- Buddycast (co-developer)
"each person has a sweet spot – a place where they are incredibly productive and at their happiest while doing so – okorians spend their lives living there – the okori sweet spot is the realization of the concept, the delivery of the impossible, from the germ of the idea to the instantiation of it"



http://www.theokorigroup.com/sweet_spot

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12.10

BitTorrent advantages?

TorrentFreak

Home

RIAA and MPAA Can't Stop BitTorrent, Study Finds

Written by Ernesto on October 14, 2009

DIGITAL DOMAIN

Will Books Be Napsterized?

By RANDALL STROSS
Published: October 3, 2009

YOU can buy "The Lost Symbol," by Dan Brown, as an e-book for \$9.99 at Amazon.com.

Enlarge This Image



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Or you can don a pirate's cap and snatch a free copy from another online user at RapidShare, Megaupload, Hotfile and other file-storage sites.

12.11

Bittorrent meets DMCA and RIAA

- Indirect Swarm detection
 - In swarm? Liable
 - NAT, other IP address
 - "in-the-wild" experiment
- False positives
 - Direct harder
- Man-in-the-middle
 - No Encryption



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12.12